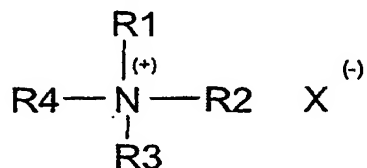


## Claims

1. An antibacterial additive for melamine resins, particularly for melamine-formaldehyde or  
 5 melamine/urea-formaldehyde resins, characterized in that it
- has at least one borate salt as active antibacterial compound, the borate salt being a salt of orthoboric acid  $H_3BO_3$  and/or metaboric acid  $HBO_2$  and/or  
 10 of polyboric acids  $H_{n-2}B_nO_{2n-1}$ , and
  - has at least one quaternary ammonium compound of the formula



- with  $R_1$ ,  $R_2$ ,  $R_3$  =  $C_1$ - $C_5$  alkyl,  $R_4$  =  $C_1$ - $C_{20}$  alkyl or  
 15 benzyl, it being possible for  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  to be identical or different, and X = chloride or bromide.

2. The antibacterial additive for melamine resins of claim 1, characterized in that the melamine resins are  
 20 formed by condensation of melamine or of mixtures of urea with melamine with aldehydes or mixtures of aldehydes such as, for example, formaldehyde, acet-  
 aldehyde, trimethylolacetaldehyde, acrolein, benzaldehyde, furfural, glyoxal, glutaraldehyde,  
 25 phthalaldehyde, terephthalaldehyde, isobutyraldehyde, acetone or ketones such as, for example, methyl ethyl ketone and diethyl ketone.

3. The antibacterial additive for melamine resins of claim 1 or 2, characterized in that the melamine resins are  
 30 etherified by reaction with  $C_1$ - $C_4$  alcohols and/or etherified and subsequently transesterified with  $C_4$ - $C_{18}$  alcohols and/or diols and/or

etherified and partly reacted with bisepoxides.

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4. The antibacterial additive for melamine resins of any one of the preceding claims, **characterized** in that at least one borate salt can be described by the following formula

5  $M_a B_b O_c \cdot d H_2O$  and/or

$M_a N_a B_b O_c \cdot d H_2O$ , where

$a, a' = 1$  or  $2$

$b = 1$  to  $8$

$c = 1$  to  $13$

10  $d = 0$  to  $10$

$M, N = NH_4, Na, K, Li, Ca, Mg, Zn$ , and where

$M, N, a$  and  $a'$  may be identical or different.

5. The antibacterial additive of at least one of the  
15 aforementioned claims, **characterized** in that at least one borate salt is  $Na_2B_4O_7 \cdot dH_2O$  where  $d = 0, 5$  or  $10$ ;  $NaBO_2 \cdot dH_2O$  where  $d = 2$  or  $4$ ;  $NaB_5O_8 \cdot 5H_2O$ ;  $Na_2B_8O_{13} \cdot 4H_2O$ ;  $Ca_2B_6O_{11} \cdot 5H_2O$ ;  $NaCaB_5O_9 \cdot dH_2O$  where  $d = 5$  or  $8$ ;  $LiBO_2 \cdot 8H_2O$ ;  $LiB_5O_8 \cdot 5H_2O$ ;  $Li_2B_4O_7 \cdot 3H_2O$ ;  $K_2B_4O_7 \cdot 4H_2O$ ;  $KB_5O_8 \cdot 4H_2O$ ;  
20  $NH_4B_5O_8 \cdot 4H_2O$ ;  $(NH_4)_2B_4O_7 \cdot 4H_2O \cdot 4H_2O$ ;  $Zn_2B_6O_{11} \cdot dH_2O$  where  $d = 3.5, 7-7.5, 9$  and/or  $ZnB_2O_4 \cdot 2H_2O$ .

6. The antibacterial additive of at least one of the preceding claims, **characterized** in that at least one  
25 borate salt is technical zinc borate  $ZnO \cdot B_2O_3 \cdot dH_2O$  with  $\geq 45\%$  by weight  $ZnO$  and  $\geq 36\%$  by weight  $B_2O_3$  or technical sodium borate  $Na_2O \cdot B_2O_3 \cdot 10 H_2O$ .

7. The antibacterial additive of at least one of the  
30 preceding claims, **characterized** in that as sole borate salt it has technical zinc borate  $ZnO \cdot B_2O_3 \cdot dH_2O$ .

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8. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 0.1% to 3% by weight, based on the amount of solid melamine resin.

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9. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 1% to 2.5% by weight, based on the amount of solid melamine resin.

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10. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 1.8% to 2.2% by weight, based on the amount of solid melamine resin.

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11. The antibacterial additive of at least one of the preceding claims, **characterized** in that at least one quaternary ammonium compound is benzalkonium chloride.

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12. The antibacterial additive of claim 11, **characterized** in that it has technical zinc borate  $\text{ZnO} * \text{B}_2\text{O}_3 * d\text{H}_2\text{O}$  and/or technical sodium borate  $\text{Na}_2\text{O} * \text{B}_2\text{O}_3 * d\text{H}_2\text{O}$  with  $d = 10$  and benzalkonium chloride in a weight ratio of 2:2:1.

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13. The antibacterial additive of claim 12, **characterized** in that the amount of technical zinc borate and/or technical sodium borate and benzalkonium chloride is 0.1% to 1% by weight, based on the amount of solid melamine resin.

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14. The antibacterial additive of claim 12, **characterized** in that the amount of technical zinc borate and/or technical sodium borate and benzalkonium chloride is 0.2% to 0.6% by weight, based on the amount of solid melamine resin.

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15. An antibacterial melamine resin comprising an antibacterial additive of at least one of the preceding claims.

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16. A process for producing an antibacterial melamine resin of claim 15, **characterized** in that an antibacterial additive of any one of claims 1 to 14 is mixed with a melamine resin present in dissolved form, the additive being admixed to the melamine resin in solid and/or liquid form to give an antibacterial melamine resin in suspended form which subsequently, directly or following conversion into a solid resin, is processed further at a later point in time.

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17. The process of claim 16, **characterized** in that the antibacterial additive is admixed during the melamine resin synthesis after the melamine resin precondensate obtained in the melamine resin synthesis has cooled.

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18. The process of claim 16, **characterized** in that the antibacterial additive is admixed after the melamine resin synthesis, the admixing taking place to a melamine resin present in dissolved form as a liquid resin, or, where a solid resin is present, the admixing taking place after the solid resin has been converted into the dissolved form.

19. The process of any one of claims 16 to 18, **characterized** in that the borate salt present in the additive is mixed with the melamine resin together with and/or after and/or before the quaternary ammonium compound.

20. An antibacterial laminate comprising an antibacterial melamine resin of claim 15.

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21. A process for producing an antibacterial laminate of claim 20, **characterized** in that

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a. a dry absorbent sheetlike structure is impregnated with the antibacterial melamine resin present in dissolved form,

5 b. the antibacterial sheetlike structure thus obtained is dried, and

c. the dried antibacterial sheetlike structure is pressed with one or more resin-impregnated interlayers or with a support material, to form a laminate, and is fully cured.

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22. The process of claim 21, **characterized** in that the melamine resin comprises further additives such as, for example, wetting agents or release agents, plasticizers and curing agents and also other customary additions.

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23. The use of an antibacterial laminate of claim 20 for surfaces and floors.